



TRANSLATION of an Office Action

Your file: H51-161297M/TRK

Our file: P/16SU5442/DE

**GERMAN PATENT
AND TRADEMARK OFFICE**

Date : June 28, 2008
Receipt : July 16, 2008
Serial No.: 103 41 817.2-51
Applicant : AutoNetworks
Technologies, Ltd. et al.

Request for examination, date of payment November 3, 2006.

Please find below report on the examination of the application.

The term for response is **4 months**, running from the date of receipt.

(... formalities ...)

If the specification, claims or drawings are amended in the course of the proceedings, Applicant should, unless the amendments are proposed by the Patent Office, state in detail where the features of the invention described in the new documents have been disclosed in the original documents.

Information on the Option of Dividing Out a Utility Model

Applicants for a patent application filed for the Federal Republic of Germany may file a utility model application concerning the same subject matter while claiming the date of application of the earlier patent application. This dividing out (Sect. 5 Utility Model Act) is possible before 2 months have passed following the end of the month wherein the patent application was terminated by a legally valid rejection, voluntary withdrawal, or having been deemed to have been withdrawn, an opposition procedure was concluded, or - where a patent has been granted - the term for appeal against the decision of grant has passed without effect. Detailed information about requirements for a utility model application, including dividing out, is contained in the Information Sheet for Utility Model Applicants (G 6181) which can be obtained free of cost at the German Patent and Trademark Office, and at the public patent libraries.



This Office Action for the first time makes reference to the following citations (the consecutive numbers of which will be referred to also in any future Office Actions):

- (1) JP 06-344827 A. Patent Abstracts of Japan, 1994, 06-344827 and the related Japanese published patent application
- (2) JP 2000-89301 A. Patent Abstracts of Japan, 2000, 2000-89301 and the related Japanese published patent application

- 1) An imaging device having all the features of the subject matter of application in accordance with pending claim 1 as received on December 10, 2003 is already known from pre-published citation (1); cf. in particular Figs. 1 to 6 in conjunction with the Abstract. Namely, the imaging device according to (1) includes the following features:
 - a) an image pickup element (camera 11, camera main body 20) configured to simultaneously pick up images in plural visual field directions,
 - b) an image pickup lens (condenser lens 17) arranged on a front face of the image pickup element, and
 - c) a first optical element (second mirror 26 has convex surfaces 26a, 26b) arranged on a front face of the image pickup lens and having a concave lens property due to the convex shape of the reflective surfaces, wherein
 - d) the first optical element guides lights from wide angle ranges in partial visual field directions onto the image pickup element via the image pickup lens, cf. in particular Figs. 2, 3, and 6.

Pending claim 1 is therefore not allowable due to lack of novelty of its subject matter.

- 2) A vehicle circumference visualizing apparatus having all the features of the subject matter of application in accordance with pending claim 16 as



received on December 10, 2003 is already known from pre-published citation (1); also cf. in particular Figs. 1 to 6 in conjunction with the Abstract. Namely, the vehicle circumference visualizing apparatus according to (1) includes the following features:

- a) an imaging device disposed at a front portion of a vehicle; cf. in particular Fig. 1,
- b) an image processing section configured to perform predetermined image processing with respect to an image picked up by the imaging device; cf. in particular Fig. 6 and reference numeral 16 therein, and
- c) a display device arranged within the vehicle and displaying the image processed by the image processing section; cf. in particular Fig. 6 and reference numeral 15 therein,

wherein the imaging device comprises:

- d) an image pickup element (camera 11, camera main body 20) configured to simultaneously pick up images in plural visual field directions,
- e) an image pickup lens (condenser lens 17) arranged on a front face of the image pickup element, and
- f) a first optical element (second mirror 26 has convex surfaces 26a, 26b) arranged on a front face of the image pickup lens and having a concave lens property due to the convex shape of the reflective surfaces, wherein
- g) the first optical element guides lights from wide angle ranges in partial visual field directions onto the image pickup element via the image pickup lens; cf. in particular Figs. 2, 3, and 6.

Pending claim 16 is therefore also not allowable due to lack of novelty of its subject matter.

- 3) Pending claims 2 to 15 and 17 to 19 as received on December 10, 2003 are not allowable together with non-allowable claims 1 and 16 to which they are appended.



Apart from this, the features of the subject matter of application as contained in pending claims 2, 3, 5, 7 to 15, and 17 to 19 are either found in the cited prior art or constitute purely customary technical or workshop measures that lack an independent significance for forming the basis of a patent; cf., e.g.:

concerning claims 2, 5, 11 and 17:

(2), in particular Figs. 1 to 4 with text,

concerning claim 3:

(1), in particular the Figs. 1 to 6 with text
and

(2), in particular Figs. 1 to 4 with text,

concerning claim 8:

(1), in particular Figs. 3 and 5 with text
or

(2), in particular Figs. 1 and 2 with text,

and

concerning claim 10:

(1), in particular Figs. 3 and 5 with text.

- 4) Nevertheless, considering the cited prior art, features of claims 1 and 16 that are directed to the specific execution of the subject matter of application as contained in pending subclaims 4 and 6 might presumably be allowable.
- 5) If agreeing to the claims version indicated under item 4, and in order to expedite the procedure, applicant is invited to file fair copies of new claims together with a fair copy of the related description already adapted to the claims, wherein the prior art known from (1) should be discussed as an introduction.



- 6) With the papers currently on file, grant of a patent is not possible. If the former are maintained without changes or with identical contents, rejection of the application must rather be expected.

Examining Section for B60R 1/10 B
Dr. Haupt-Nagengast

Enclosure: c/ citations (1) and (2)

* NOTICES *

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1]A camera (11) arranged at anterior part of vehicles.

A display for indication (15) which displays an image pick-up which it was furnished in a driver field of view of vehicles, and was caught with the above-mentioned camera.

Are the above the vehicle longitudinal direction dead angle monitor which it had, and the above-mentioned camera (11), The 1st mirror (24) has been arranged ahead of a camera body condenser (17), and the 2nd mirror (26) for making a condenser picturize an object image via said 1st mirror to the condenser side of the 1st mirror has been arranged further.

[Claim 2]The vehicle longitudinal direction dead angle monitor according to claim 1 having made the 1st mirror (24) into a concave bend reflector, and making the 2nd mirror (26) with a convex-curved reflector.

[Claim 3]The vehicle longitudinal direction dead angle monitor according to claim 1 which arranges an auto iris (18) and a CCD image sensor (19) after a condenser (17) to an optical system of a camera (11), and is characterized by things.

[Translation done.]

* NOTICES *

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention eliminates the dead angle of the longitudinal direction of the vehicles (a general automobile, a construction vehicle industrial vehicle, etc.) of the car it runs, and relates to the dead angle monitor which can recognize the object (obstacle) in the dead angle, etc. easily.

[0002]

[Description of the Prior Art]When it is going to appear, for example from an alley in a main road, carrying out the operation run of the car, Even if the tip part of the car tends to check existence of objects, such as a right-and-left traffic situation of a main road or an obstacle, in the state where it does not project to a main road, Since it is difficult to produce the dead angle in an alley corner part, and to carry out the localization of the object existence in a main road, in order to cancel this difficulty, in the former, it was common knowledge to use the V type mirror 1 as shown, for example in drawing 1 for the tip part of the bonnet 2 of a car, attaching it.

[0003]

[Problem(s) to be Solved by the Invention]However, the object image by which a reflective display is carried out by this V type mirror 1 seems to be shown in drawing 2 reversely [right-and-left]. Namely, the right lateral 2a of the rightward object 2 which appears by the right-hand side reflective mirror 1a of the V type mirror 1, It is set to left-hand side 2'a in reflected-figure 2' projected on the reflective mirror 1a, and left lateral 2b of the object turns into right-hand side 2'b of reflected-figure 2', and will be displayed, and both sides of the object 2 will look reverse. As for the reflected-figure 3', in the object 3 which appears by the left-hand side reflective mirror 1b of the V type mirror 1, both sides look conversely similarly.

[0004]Therefore, it was difficult to grasp the impaction efficiency situation of the object in the

longitudinal direction of a vehicle front in an instant, and when especially the object was the vehicles which run a road top, the check of whether to run running the right-hand side of the road or left-hand side was the thing which it ** and is easy to take, butter fish.

[0005]Between the image projected on the mirror 1a or 1b since it is what used attaching to the tip part of a bonnet, and a driver's eye points 4 left the above-mentioned V type mirror 1, the reflected figure looked small by this, it did not see but there was fault of ****. By attaching a V type mirror to the tip part of a bonnet, it worsened, and moreover, the V type mirror which protrudes on the bonnet became an obstacle, a new dead angle was fabricated, and appearance also had a problem not desirable on a safety operation.

[0006]

[Means for Solving the Problem]This invention ahead of a main part of an imaging camera which was made paying attention to this conventional problem, and is arranged in a front end center of the body, A curved surface mirror of a right-and-left couple which is formed in both sides bordering on a perpendicular line, and is arranged towards a condenser of the above-mentioned camera body, A camera of composition of making it come to provide a mirror of a right-and-left couple for making the above-mentioned curved surface mirror reflect an object image which is arranged in the direction of this side of these curved surface mirrors, and exists in a longitudinal direction of the body, An object image which consists of television displays for indication which display an image with this camera, and is located in the front and method both sides of right and left of vehicles by a wide viewing angle. It is in providing a vehicle longitudinal direction dead angle monitor which made it display on a television display for indication furnished to the vehicle interior of a room, displayed a display image further projected on the display for indication in the regular direction, and was excellent in visibility.

[0007]

[Example]This invention is explained in detail based on the example shown in a drawing below.

[0008]It is a camera by which 11 is fixed to the center section of the radiator grill 12 of a car with the mounting bolt 13 and the mounting nut 14 in drawing 3 thru/or drawing 6, For example, 15 is furnished to the position with a legible driver of the car interior of a room, the display for indication by cathode-ray tube, a liquid crystal display panel, etc. and 16 are the controllers for making the photographing signal photoed with the above-mentioned camera 11 with a status signal, and making it project on the above-mentioned display for indication 15.

[0009]As shown in drawing 3 and drawing 4, the structure of the above-mentioned camera 11 The condenser 17, The auto iris (automatic diaphragm) 18 arranged behind this condenser 17 and the camera body 20 which has CCD image sensor 19 further arranged behind this auto iris 18 are arranged in the center section of the 1st bracket 21. The 1st bracket 21 holding said camera body 20 is being fixed to the center section with the 2nd and 3rd brackets with which

22 and 23 are combined in one. 24 is the 1st mirror currently held by the 4th bracket 25 at the front center part of the camera body 20, and this 1st mirror 24 is formed bordering on that center in the concave bend reflectors 24a and 24b on either side. 26 is the 1st mirror 24 of the above, and the 2nd mirror that is arranged between the camera bodies 20 and moreover has the convex surfaces 26a and 26b symmetrically in the method of both sides bordering on the camera body 20, and fixed holding of this 2nd mirror 26 is carried out by said 2nd bracket 22. [0010]For [these convex surfaces 26a and 26b] attachment reflects in said concave bend reflectors 24a and 24b the incident light which enters from the windows 28a and 28b of the right and left provided in the Yamagata case 27 of the camera 11, and positioning is made so that you can make it enter into the camera body 20.

[0011]The transparent cover for protection against dust / water proof in which 29 is laminated on each of the windows 28a and 28b of said right and left, and 30 show the connector for transmitting the imaging signal acquired from the camera body 20 to the controller 16.

[0012]Although the above is the structure of this example, Next, if a power supply is supplied to the above-mentioned camera 11, the controller 16, and the display for indication 15 and each is started at the time of a run of a car if the operation is described, From the window 28a on the left-hand side of the camera 11 in drawing 3 and drawing 6, the object image "B" in the left spaces the left-hand side window 28a, and it reflects in the convex surface 26a on the left-hand side of the 2nd mirror 26, and further, it is reflected in the left-hand side concave bend reflector 24a, and this reflected figure is photoed in the left half of the condenser 17. From the right-hand side window 28b, the rightward object image "C" spaces the right-hand side window 28b, and it reflects in the right-hand side convex surface 26b, and further, it is reflected in the right-hand side concave bend reflector 24b, and this reflected figure is photoed in the right half of the condenser 17.

[0013]Therefore, the object image "B" which exists in the forward left side of the body according to this camera 11, It is reflected twice by two reflectors, the convex surface 26a by the 2nd mirror 26, and the concave bend reflector 24a by the 1st mirror, and enters into the condenser 17, Since it is reflected twice by two reflectors, the convex surface 26b and the concave bend reflector 24b, and the object image "C" enters into the condenser 17 according to them similarly, those object images "B" and "C", In response to two reflection, it is displayed on the display for indication 15 in the regular direction, and the check of the object image by a display for indication is easy, and the safety of operation is improved.

[0014]If it is in this example, since the condenser 17 is combined using two or more lenses, the aberration of a lens can be amended effectively.

[0015]Since the inner package of the auto iris is carried out into the camera body 20, it blooms cloudy with this example with daytime, the evening, or fine, and an effective display is possible at it according to the light and darkness of the circumferences at the time etc.

[0016] Keeping the outside of the camera 11 small, since the convex surface and the concave bend reflector were combined and arrangement, i.e., the 1st mirror 24 and 2nd mirror 26, is furthermore combined with the optical system of this example. And the large angle of visibility θ (for example, before or after 40 degrees) can be secured, therefore the camera 11 can be made into small structure, and a monitor camera with a large angle of visibility can be provided, and the very advantageous vehicle longitudinal direction dead angle monitor as an object for mount can be provided.

[0017] If it was in this example, the example by which the 1st mirror 24 was formed in the concave bend reflector, and the 2nd mirror 26 was formed in the convex surface was shown, but it does not restrict to this, and if possible [in photography of the object image of a vehicle longitudinal direction] also as concavo-convex reverse, flat surfaces, or these combination, it can close.

[0018]

[Effect of the Invention] In the monitor provided with the display for indication 15 which displays the image pick-up which this invention was furnished in the camera 11 arranged at the anterior part of vehicles, and the driver field of view of vehicles, and was caught with the above-mentioned camera as mentioned above, The above-mentioned camera 11 arranges the 1st mirror 24 ahead of the camera body condenser 17, Since it is the vehicle longitudinal direction dead angle monitor which has furthermore arranged the 2nd mirror 26 for making a condenser picturize an object image via said 1st mirror to the condenser side of the 1st mirror, according to this. From entering into a condenser by two reflection through the 1st and 2nd mirrors, the object image which enters from the longitudinal direction of the camera 11. The display image which picturizes with the above-mentioned camera 11 and is displayed by the display for indication 15 from being displayed in the direction equal to direction of a actual object image. The position of the object which exists in the longitudinal direction of a car, direction, etc. can be grasped correctly and easily, and the effect that the safety of operation is improved by this is acquired.

[Translation done.]

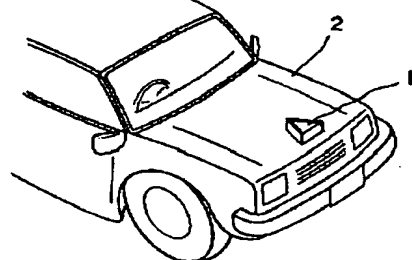
* NOTICES *

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

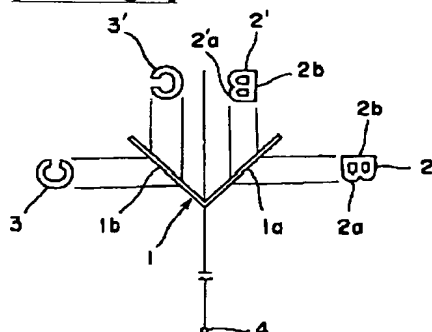
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

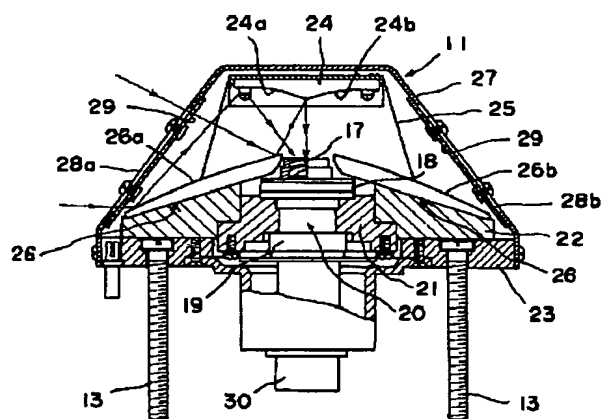
[Drawing 1]



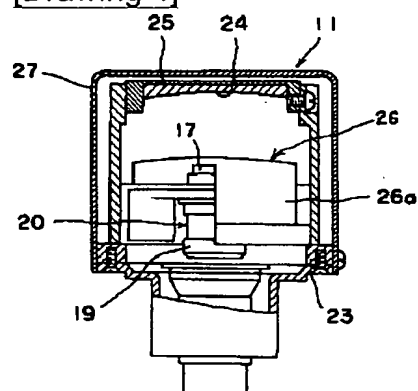
[Drawing 2]



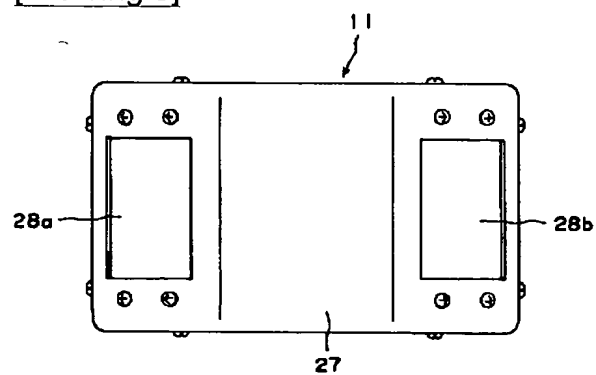
[Drawing 3]



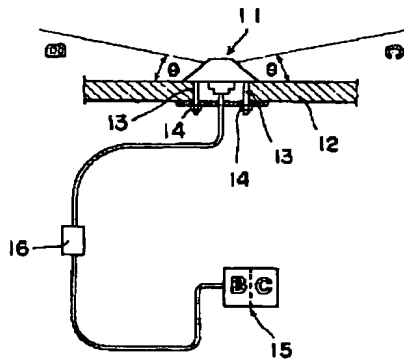
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平6-344827

(43) 公開日 平成6年(1994)12月20日

(51) Int.Cl.⁵

B 6 0 R 1/00

識別記号

庁内整理番号

8012-3D

F I

技術表示箇所

審査請求 未請求 請求項の数 3 O L (全 4 頁)

(21) 出願番号 特願平5-134651

(22) 出願日 平成5年(1993)6月4日

(71) 出願人 000001476

株式会社カンセイ

埼玉県大宮市日進町2丁目1910番地

(71) 出願人 592163734

昭和光機製造株式会社

東京都世田谷区新町3-5-3

(72) 発明者 青山益敏

埼玉県大宮市日進町2丁目1910番地 株式会社カンセイ内

(72) 発明者 吉田敏宏

埼玉県大宮市日進町2丁目1910番地 株式会社カンセイ内

(74) 代理人 弁理士 本多 小平 (外3名)

最終頁に続く

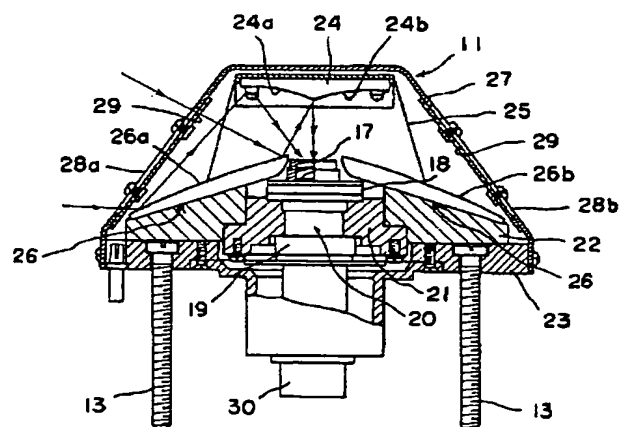
(54) 【発明の名称】 車両左右方向死角モニター

(57) 【要約】

【目的】 車両左右方向の視角内における物体の存在の有無を確認することができるモニターの開発。

【構成】 撮像レンズの前方に、第1及び第2のミラーを配置して物体像を、2回の反射によってカメラに撮像せしめる構造。

【効果】 自動車の左右方向の視角内に存在する物体の位置向きを、正確かつ容易に把握することができて運転の安全性が高められる。



【特許請求の範囲】

【請求項1】 車両の前方に配置されるカメラ(11)と、車両の運転者視界内に設備され、かつ上記カメラで捉えた撮像を表示する表示器(15)を備えたモニターにおいて、上記カメラ(11)は、カメラ本体集光レンズ(17)の前方に第1のミラー(24)を配置し、さらにその第1のミラーの集光レンズ側に、物体像を、前記第1のミラーを介して集光レンズに撮像せしめるための第2のミラー(26)を配置したことを特徴とする車両左右方向死角モニター。

【請求項2】 第1のミラー(24)を凹曲反射面とし、第2のミラー(26)を凸曲反射面としたことを特徴とする請求項1記載の車両左右方向死角モニター。

【請求項3】 カメラ(11)の光学系に、集光レンズ(17)に次いでオートアイリス(18)、CCD撮像素子(19)を配置してなることを特徴とする請求項1記載の車両左右方向死角モニター。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、走行する自動車(一般自動車、建設車両産業用車両等)の車両の左右方向の死角を排除して、その死角内にある物体(障害物)等を容易に認識することができる死角モニターに関するものである。

【0002】

【従来の技術】自動車を運転走行しながら、例えば路地から本道に出ようとするとき、その自動車の先端部が本道に突き出さない状態で本道の左右往来状況あるいは障害物等の物体の存在を確認しようとしても、路地コーナ一部における死角が生じて、本道における物体存在の位置確認をすることが困難であるため、この困難性を解消するため、従来では、例えば図1に示すような、V型ミラー1を自動車のボンネット2の先端部に取付けて使用することが周知であった。

【0003】

【発明が解決しようとする課題】しかしながら、かかるV型ミラー1により反射表示される物体像は図2に示すように、左右反対に見える。すなわち、V型ミラー1の右側反射ミラー1aで見える右方向の物体2の右側面2aは、その反射ミラー1aに映し出される反射像2'において左側2'aとなり、またその物体の左側面2bは反射像2'の右側2'bとなって表示され、物体2の左右両側が逆に見えることになる。V型ミラー1の左側反射ミラー1bで見える物体3においてもその反射像3'は、同様にして左右両側が逆に見える。

【0004】従って車両前方の左右方向にある物体の位置移動状況を、瞬時に把握することが困難であり、特にその物体が道路上を走行する車両である場合、その道路の右側を走行しているのか又は左側を走行しているのかの確認がしづらく、誤認しやすいものであった。

【0005】また上記V型ミラー1は、ボンネットの先端部に取付け使用するものであるため、ミラー1a又は1bに映し出される像と運転者のアイポイント4との間が離れ、これによって反射像が小さく見えて、見づらいという不具合があった。さらに、ボンネットの先端部にV型ミラーを取付けることにより見栄えも悪くなり、その上、ボンネット上に突設されているV型ミラーが障害物となって新たな死角を成形して安全運転上好ましくない等の問題点があった。

10 【0006】

【課題を解決するための手段】本発明は、かかる従来の問題点に着目してなされたもので、車体の前端中央部に配置される撮像カメラ本体の前方に、垂直線を境に左右両側に形成されかつ上記カメラ本体の集光レンズに向けて配置される左右一対の曲面ミラーと、これらの曲面ミラーの手前方向に配置されて、車体の左右方向に存在する物体像を、上記の曲面ミラーに反射せしめるための左右一対のミラーを具備せしめてなる構成のカメラと、該カメラによる映像を表示するテレビ表示器とで構成して、車両の前方かつ左右方両側に位置される物体像を広視野角で、車室内に設備したテレビ表示器に表示させ、さらにはその表示器に映し出される表示像を正規の向きで表示させて視認性に優れた車両左右方向死角モニターを提供することにある。

【0007】

【実施例】以下に本発明を図面に示す実施例に基いて詳細に説明する。

【0008】図3乃至図6において、11は自動車のラジエタグリル12の中央部に取付ボルト13及び取付ナット14により固定されるカメラであり、15は車室内の運転者が見やすい位置に設備されている例えばブラウン管、液晶表示板等による表示器、16は、上記カメラ11により撮影された撮影信号を、表示信号となして上記の表示器15に映し出させるためのコントローラである。

【0009】上記カメラ11の構造は、図3及び図4に示すように、集光レンズ17と、この集光レンズ17の後方に配置されるオートアイリス(自動絞り)18と、さらにこのオートアイリス18の後方に配置されるCCD撮像素子19を有するカメラ本体20を第1のブラケット21の中央部に配置している。22及び23は、一体的に結合されている第2及び第3のブラケットでその中央部に前記カメラ本体20を保持する第1のブラケット21が固定されている。24は、カメラ本体20の前方中央部に、第4のブラケット25によって保持されている第1のミラーであって、この第1のミラー24は、その中心を境に左右の凹曲反射面24a、24bに形成されている。26は、上記第1のミラー24と、カメラ本体20との間に配置され、しかもカメラ本体20を境とする左右両側方に対称的に凸曲面26aと26bを有

している第2のミラーであって、この第2のミラー26は、前記第2のブラケット22によって固定保持されている。

【0010】またこれら凸曲面26a、26bの取付け向きは、カメラ11の山形ケース27に設けられている左右の窓28a、28bから入射される入射光を、前記凹曲反射面24a、24bに反射させてカメラ本体20に入射せしめることができるように位置設定がなされている。

【0011】29は前記左右の窓28aと28bの夫々に被着されている防塵・防水用の透明カバー、30はカメラ本体20から得られる撮像信号をコントローラ16に送信するためのコネクタを示す。

【0012】以上が本実施例の構造であるが、次にその作用について述べると、自動車の走行時において、上記カメラ11、コントローラ16及び表示器15に電源を投入して夫々を起動させると、図3及び図6におけるカメラ11の左側の窓28aからは左方向における物体像「B」が左側窓28aを透して、第2のミラー26の左側の凸曲面26aに反射し、さらにこの反射像は、左側の凹曲反射面24aに反射されて集光レンズ17の左側半分で撮影される。また右側の窓28bからは、右方向の物体像「C」が右側窓28bを透して、右側の凸曲面26bに反射し、さらにこの反射像は、右側の凹曲反射面24bに反射されて集光レンズ17の右側半分で撮影される。

【0013】従ってこのカメラ11によれば、車体の前方左側に存在する物体像「B」は、第2のミラー26による凸曲面26a及び第1のミラーによる凹曲反射面24aの二つの反射面により2回反射されて集光レンズ17に入射され、同様に物体像「C」も凸曲面26b及び凹曲反射面24bの二つの反射面によって2回反射されて集光レンズ17に入射されることから、それらの物体像「B」「C」は、2回の反射を受けて正規の向きで表示器15に表示され、表示器による物体像の確認が容易で運転の安全性が高められる。

【0014】また本実施例にあつては、集光レンズ17を、複数枚のレンズを使用して組合せていることから、レンズの収差を有効に補正することができる。

【0015】また本実施例では、カメラ本体20内にオートアイリスを内装していることから、昼と夕あるいは晴と曇り時等の周囲の明暗に応じて有効な表示が可能である。

【0016】さらに本実施例の光学系には、凸曲面と凹曲反射面とを組合せ配置、すなわち第1のミラー24と第2のミラー26を組合せていることから、カメラ11の外形を小型に保ちながら、しかも広い視野角 θ （例えば40度前後）を確保することができ、従ってそのカメラ11を小型構造とすることができると共に、視野角の広いモニターカメラを提供することができ、車載用とし

て極めて有利な車両左右方向死角モニターを提供することができる。

【0017】なお本実施例にあつては、第1のミラー24が凹曲反射面、第2のミラー26が凸曲面に形成された例を示したが、これに限るものではなく、凹凸逆、平面、またはこれらの組合せとしても、車両左右方向の物体像の撮影を可能ならしめることができる。

【0018】

【発明の効果】以上のように本発明は、車両の前部に配置されるカメラ11と、車両の運転者視界内に設備され、かつ上記カメラで捉えた撮像を表示する表示器15を備えたモニターにおいて、上記カメラ11は、カメラ本体集光レンズ17の前方に第1のミラー24を配置し、さらにその第1のミラーの集光レンズ側に、物体像を、前記第1のミラーを介して集光レンズに撮像せしめるための第2のミラー26を配置した車両左右方向死角モニターであるから、これによれば、カメラ11の左右方向から入射される物体像は第1及び第2のミラーを経て2回の反射によって集光レンズに入射されることから、上記カメラ11によって撮像し、表示器15によって表示される表示像は実際の物体像の向きと等しい向きで表示されることから、自動車の左右方向に存在する物体の位置、向き等を正確かつ容易に把握することができ、これによって運転の安全性が高められるという効果が得られる。

【図面の簡単な説明】

【図1】従来例のV型ミラーの使用態様説明図。

【図2】従来例のV型ミラーの反射作用説明図。

【図3】本発明実施例モニターの内部構造平面説明図。

【図4】本発明実施例モニターの内部構造側面説明図。

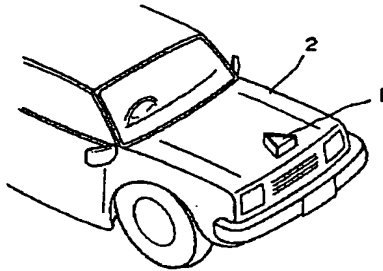
【図5】本発明実施例モニターの正面外観図。

【図6】本発明実施例モニターの使用態様説明図。

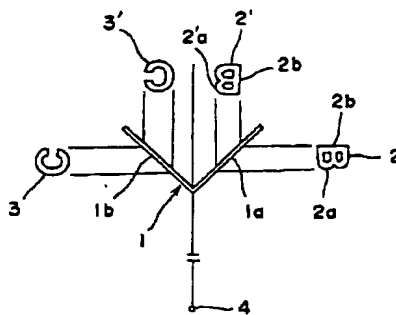
【符号の説明】

11…カメラ	12…ラジエタグリル
13…取付ボルト	14…取付ナット
15…表示器	16…コントローラ
17…集光レンズ	18…オートアイリス
19…CCD撮像素子	20…カメラ本体
21…第1のブラケット	22…第2のブラケット
23…第3のブラケット	24…第1のミラー
24a、24b…凹曲反射面	25…第4のブラケット
26…第2のミラー	26a、26b…凸曲面
27…山形ケース	28a…左側窓
28b…右側窓	29…透明カバー
30…コネクタ	

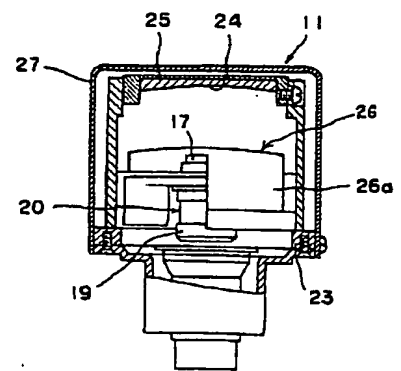
【図1】



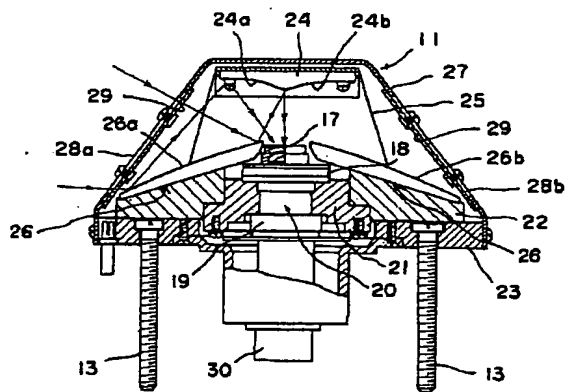
【図2】



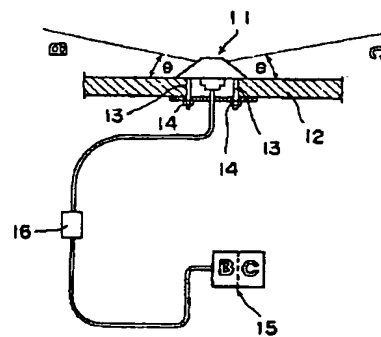
【図4】



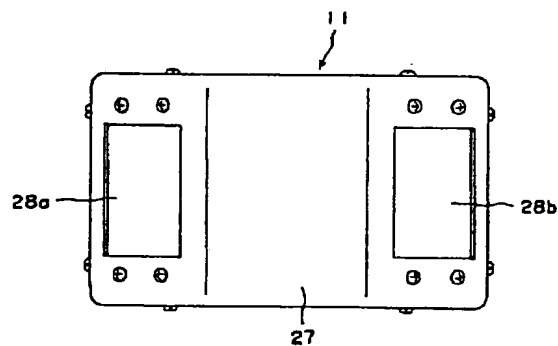
【図3】



【図6】



【図5】



フロントページの続き

(72)発明者 高橋 朗
神奈川県横浜市緑区白山一丁目22番1号
昭和光機製造株式会社内

(72)発明者 森 誠一郎
神奈川県横浜市緑区白山一丁目22番1号
昭和光機製造株式会社内

(72)発明者 岡 知史
神奈川県横浜市緑区白山一丁目22番1号
昭和光機製造株式会社内